Supporting New Parents In Their Desire to Share Baby's Life

Sook Yeon Kim - School of Design, Carnegie Mellon University, Pittsburgh, USA, (1)4152180540, sookyeonkim@gmail.com

John Zimmerman – Human-Computer Interaction Institute and School of Design, Carnegie Mellon University, Pittsburgh, USA, (1)4122681313, johnz@cs.cmu.edu

Abstract

"Look! Our baby is taking her first steps!" Parents with a newborn baby are enthusiastic about recording every "moment" of their baby's development: when they first roll over, the first words of babbling, the first steps, the first cold, the first solid food, etc. Recording with video is one of the best ways to capture the vivid moments of a baby's growth. Parents have a desire to document these moments so that they and the baby might reminisce in the future; in addition, they also want to share their baby's amazing moment with family. The new parents' parents and siblings also have a desire to see and get to know this new family member. This desire that parents have to share and the extended family's wish to consume video moments supports the construction of family and creates a sense of togetherness for extended families, particularly those who live far apart. We see this desire as an opportunity for new products and services that help families embrace their newest members through electronic sharing.

We initiated a user-centered design project to investigate the opportunities to support the new parents and their sibling for better sharing and access to baby videos. To meet their desire of sharing baby videos, we have designed "BaVio" – a new video platform that integrated into the mobile, web and TV system providing better access to their baby videos at home and outdoors. A BaVio service provides reliable web space for parents to upload videos and distribute to the registered families. Also supporting TV system to watch and create comments especially for the new parents' parents. This design solution will support them to enrich the emotional connection and togetherness with the newest members by convenient sharing, commenting and accessing to videos.

Conference theme: Modeling Experience
Keywords: Baby Video, Video sharing, Human-centered design

Introduction

Families with a newborn baby are enthusiastic about capturing every moment of their babies' growth. They want to capture, share, and cherish the first roll over, the first babble, and the first steps. Recording a video is one of the best ways to vividly capture the moments of a baby's growth. Parents have a desire to document and share their baby's amazing moments with their families. At the same time, grand parents and siblings of the new parents take great interest in welcoming this new family member to their heart. They are happy to invest their time and attention watching videos of the new baby, because they desire to participate making the baby a family member.

Recent advances in video equipment make this an interesting topic for designers. For many years the equipment has been falling in price and becoming easier to use. More recent changes including the tremendous increase in the number of video recording devices through the integration of this technology in digital cameras and phones, as well as the sudden ability to share video via web 2.0 services such as youtube.com have opened up new possibilities for video making and sharing to enter people's lives.

In this project, we focused on families that have young children (age 6-month-old to 7-years-old), investigating how they use video to capture and share moments in their daily lives. We conducted interviews with 12 families, discussing video capture, file management, and stories about sharing their videos and photos with family members. Over the course of the investigation, we chose to focus on the sharing as this represented both one of the largest challenges and one of the greatest rewards. Through an iterative, user-centered design process, we developed BaVio, a system for sharing videos within a family as part of the process of making a baby a member of the family. In this paper we present an overview of our design process, key findings that influenced the design, and details of the BaVio system.

Related Work

Related work fall into three main themes. First, there has been much research on video processing tool such as supporting browsing and searching of large collection for home and mobile videos (Gregory D ,2003; Maryam , 2004; Kihwan.,2006). These studies have attempted to find novel ways to display key frames that enable to find content of video clips more conveniently. Related video studies involve in automating context of editing processed the software technology support to automate video editing process. Similarly, they verify and segment section by similar scene or color (Girgensohn, 2000; Hua., 2003). This study is the majority of recent video studies.

The second major study field of video focus on the usage of home video. Related video works of study is *Understanding Video Work* (David, 2007), which is mainly discussing about life cycles of home videos.

Besides the studies of video field, family photo sharing which is similar to the video sharing is the third major related study field. We reviewed online and mobile photo sharing that relevantly studied for social use (AD Miller., 2007; N Van House., 2005; S Counts.,2004) and baby photo sharing (MMG Shannon ,2007).

While we research on the studies of video and photo with in the home context, we found interest to specific audience- families with young babies. New Parents with young babies have needs for tracking their baby's development (Kientz.,2007). This study focuses on how technology support new parent for consistent record keeping. Our focus interest is to share baby video that can be a record of baby's life and the purpose of sharing video as a sharing of baby's life. Some related research work focus on developing computer system that provides baby's information to family members (Moncur.,2007). However, our research advances these video works by focusing specifically on baby video sharing and how video sharing makes a new born baby as a part of a family. Current video research does not explore social aspects of sharing. By this difference, our work offers new opportunities to apply the new video technology to improve the quality of people's lives.

The overall related work-study helped us to understand the total concept of this field and enable to seek our focus of home video study . Especially it helped to focus on the baby video sharing that enhances meanings by sharing new born family member's daily life with other family members.

Design Process

Interviews and Shadowing

We conducted interviews with parents in the homes of 12 families that have babies (age 6-month-old to 7-years-old). We also interviewed 3 grandparents, to understand the problems and needs of different generation and technology circumstance to share the videos of their grand children. The interviews involved directed storytelling where parents told stories and demonstrated how they capture, organize, and share videos and photos. We investigated the parents' role of parent as well as their role as a sibling of someone with young children from whom they receive photos and videos. During the interviews we took photos (Figure 1) to document the home environment in order to better understand how the practices of video making and sharing fits in to their environments.

Figure 1**:** DVD, Videotapes, web service to share baby videos.

Data Share and Card task

We employed some participatory design techniques; giving parents (12 each different parents at their home) a stack of blank card to write down the amount of visual data (Videos, Photos) shared with different family members and then asked them to arrange in order by frequency (Figure 2). The purpose of this session was to see the big picture of visual data sharing among the family members, the influence of the sharing behavior, and the different methods of video sharing within different homes.

Figure 2: Video data share card task

Findings

Interestingly all participants expressed a fear of forgetting amazing moments with babies, and this fear of forgetting seems to be a prime motivator to continually capture video. After sharing a baby video, the new grandparents strongly encouraged the new parents to continue create and share moments from the babies' daily life. Parents and grand parents described how video contains *live* information such as sound and movement that makes it feel more like they are participating in or witnessing the actual event.

How they Share?

To better understand the process of sharing, we visualized the card sorting session participants shared (Figure 3). Mostly, the families with babies send more data than other family members and this influences an active communication among the family members. Sharing methods were different among the different members, especially for grand parents. Many of grandparents were not confident with accessing online service to watch video. Also, the grandparents need technical support for installing hardware and software, and they require lots of supports in learning a web interface or downloading video files. To simplify the process of accessing video, some of parents attach links to video files directly into emails, or they send hard copies of DVDs. The distribution of videos to others is clearly the main obstacle to current sharing practices. Here is a comment of the parent participants.

"I use all different channels to all different people. I really want to share a lot more videos with them, but it's really tricky." (Participant A, 28 years old)

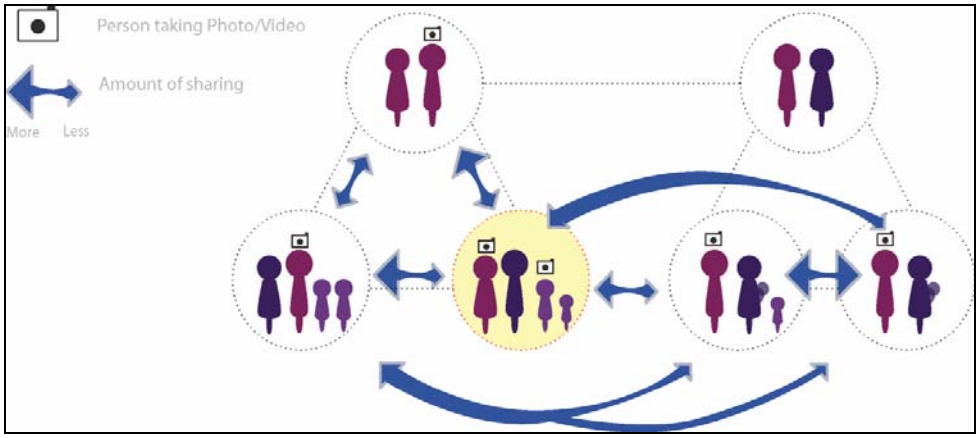


Figure 3: Consolidated model of sharing behavior. Family with babies distributes more videos and pictures to other family members.

Figure 3 shows a consolidated model of video sharing behavior. The upper left circle shows our interview family's parents and the right circle shows their father's brother and wife. A yellow circle in the middle is a family who I interviewed and the three other circles represent their siblings. The size of an arrowhead tells an amount of videos and photos sharing with other members. Bigger arrow represents more data share and smaller represents less .The camera icon represents a person who is in charge of taking videos and photos in their family. In this family model, mom and teenage daughter are taking care of photos and videos to create and share videos and photos with other family members. Also they were influenced each other by cousins, for example purchasing new equipments or creating online service accounts to share photos and videos.

Research Synthesis

Capture, Share, and Preserve

Based upon the interviews, there were several common motivations for capturing and sharing baby videos. We made diagram for research analysis and focus on sharing and preserving aspects. (Figure 4)

1. **Parents want to capture videos for themselves as a family archive and a purpose of retrieving in the future.**

2. **Parents want to capture as they think the baby will want them in the future for their own idea that they will want to revisit.**

3. **Parents fear missing a moment that they do not capture.**
4. **Parents fear losing content they have spent time to capture due to computer error or data format change.**
5. **Parents want to share videos with family to stay connected.**

6. **Parents want to share videos with family to introduce their baby as new family member, hoping he/she will be welcomed and loved by others**.

The most significant finding for parents who creating and distributing videos and photos have fear of missing a moment or loosing content they have spent time to capture. They treat visual artifacts (videos, photos) as important data for themselves as well as their baby.
Interestingly, shared videos are having different role to the received ones. One of the interview participants (grandmother) mentioned that watching video clips of their newborn grand child became a routine of her daily life. Watching videos of the new grand child helps the grandparents see himself / herself in a new family relationship.

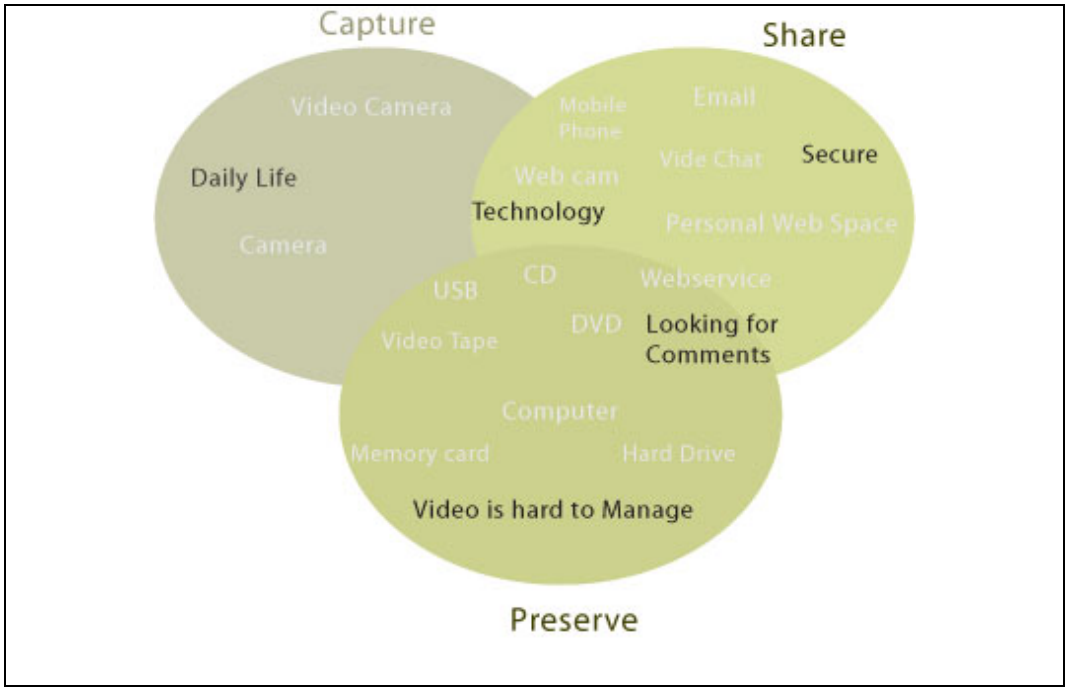


Figure 4: Research evaluation. We are focusing on Sharing and Preserving category.

Needs Validation

Based on key findings, we generated concepts that addressed the needs we identified in our fieldwork. We produced 25 concepts, which we clustered in to the following themes; technology enhancement, emotional connection, and family archive. We then further abstracted this list into four stages of video life cycle; Pre Capture, At Capture, Post Capture, Share and Comments. From the four stages, we suggested specific device and methods for capturing, saving, sharing and commenting. We conducted 4 validation sessions with 4 families individually at their house.

Need validation is a method to evaluate user's needs by showing different concepts that synthesized from the early research stage(Davidoff et al., 2007) provides more detail on the

specifics of needs validation. We showed story boards to our participants and then asking about underline needs of each concept.

	Technology Enhancement	Emotional Connection	Family Archive
Pre Capture	Affordable device and service for spontaneous capture (mobile phone, wi-fi data transfer enabled video camera)/ TV attached device for creating video comments	Expecting, planning to capture good moment / Expecting baby's development	
At Capture	Mobile video streaming/ TV video streaming/ System notice person who being invited for video streaming by mobile message/Also send message if a invited person missed sharing session	Spontaneous video share (share baby's amazing moment)	Auto save to system while capturing video
Post Capture	Web service mainly for watching video and viewing comments/ Initiating and inviting video sharing service by parents	No stress or time consuming for transferring data/ No struggle for data storing	Captured video automatically save to system/ Video Sharing session can be saved to system
Share and Comment	Web service mainly for creating watching and preserving comments/ TV service mainly for watching videos and creating videos/Notice system for arriving new videos	Video for sharing baby's life as well as family communication/ Sharing only with family / Enable to retrieve family comments / Looking for new comments/ Waiting for new videos	Web and TV based family Video album/ Video, Audio, Text comments save as family data

Table1: Concept chart of Technology Enhancement, Emotional Connection, Family Archive, listed by four stages of video life cycle.

To share key points from needs validation, here are some design opportunities to solve the existing problems:

- **They need simpler access with interface to watch, comment videos. Watching and commenting through TV will be convenient for grand parents' generation as well as others.**

- **They have desire for a live video streaming with other family members. Also other family members have desire to share live moments. They prefer mobile phone as a device for capturing baby's spontaneous moment.**

- **They want secure web service that only accessible for family members. Initiating service by baby's parents and giving invitation to others.**

- **They want web service mainly focuses on watching videos, editing videos and viewing comments and sharing videos.**

- **They want to be free from the fear of loosing data and an intricate process of transferring data from a video device to a computer.**

Design

Based on findings from needs validation we designed "BaVio" – a new web based video platform that provides improved sharing of videos to mobile devices, PCs, and televisions. BaVio video service provides web space for parents to upload videos and distribute to the registered family members. This design solution will support them to enrich the emotional connection and togetherness with the newest members by convenient sharing and accessing to videos. Here are the key features of the Bavio system:

1. **Mobile Streaming of live events**
2. **Video data automatically save in BaVio system**
3. **TV interface for viewing and commenting on shared baby videos**
4. **Commentary features: Providing small device that attached on TV for recording video comments and operates by remote control.**
5. **Initiate service by parents and invite family to share videos**

System Architecture

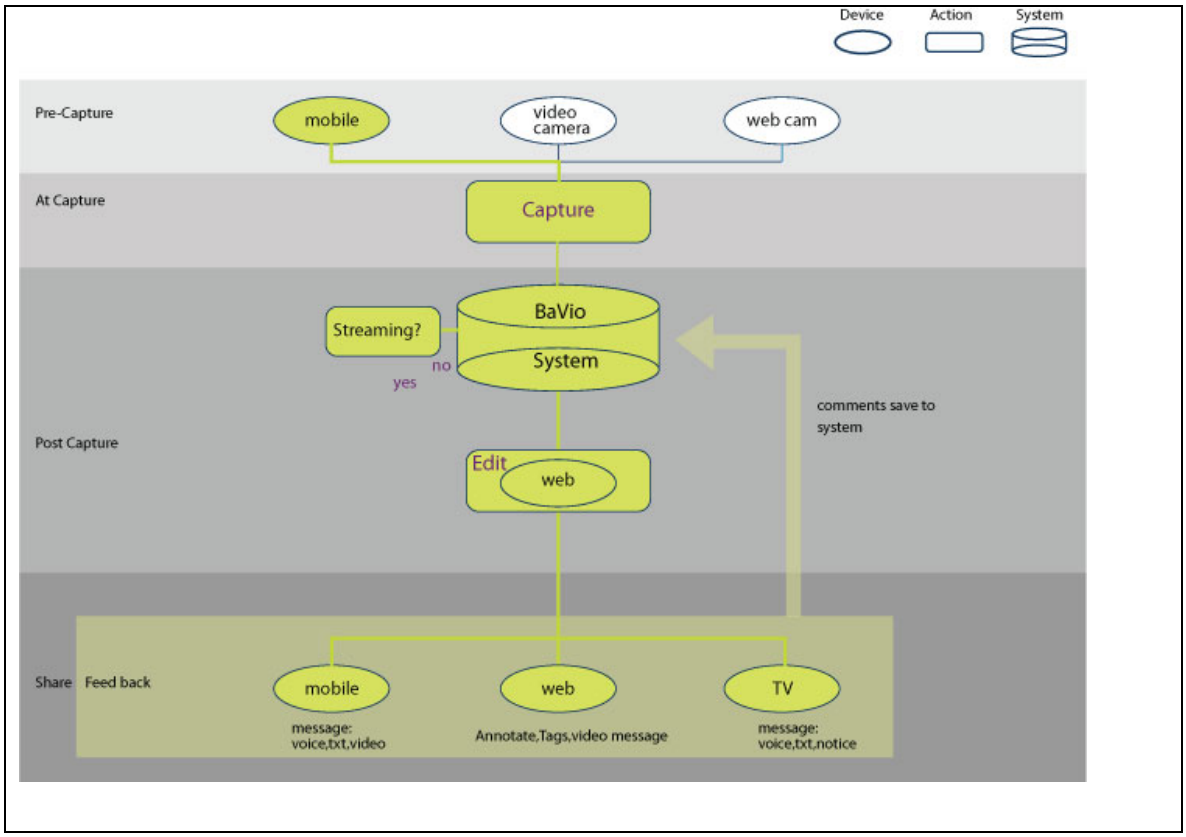


Figure 5: BaVio System Diagram

There are four stages of video life-term process:

Pre Capture

People use different types of devices to created videos. Through the concept validation session, can see the opportunities for capturing spontaneous baby videos by mobile phone.

At Capture

While they capture the video with mobile phone they can use video streaming option to share spontaneous baby movements with others.

Post Capture

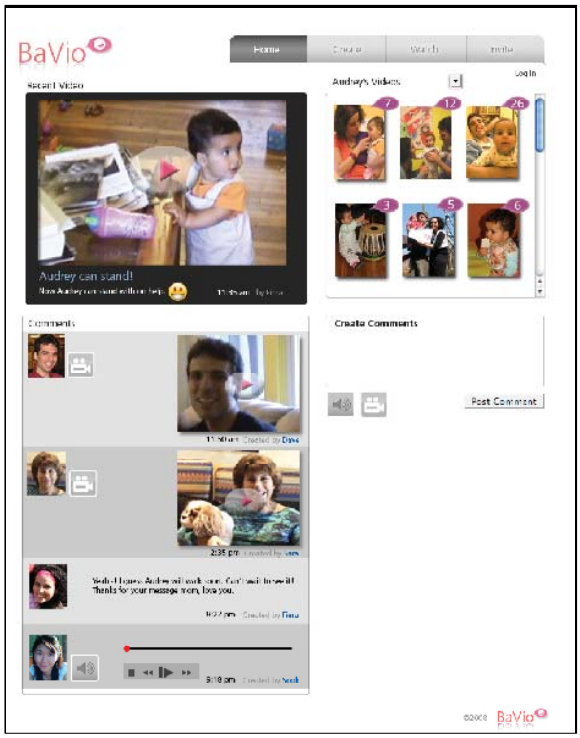
After video recording, the data will be automatically save into the BaVio system and able to edit through BaVio website.

Share / Comments

This video will automatically transfer to the subscribed person, if she/he missed live video sharing invitation.

Interaction and interface

Web Interface



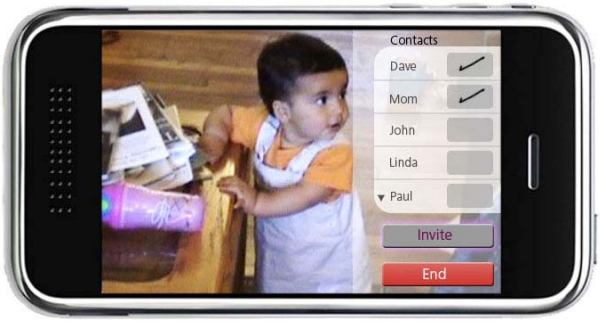
User can subscribe BaVio service through a website and enable mobile video streaming service and own BaVio TV channel. Also user can only share their own baby's video with other family members by invitation. Our research revealed four main design opportunities for BaVio Web service system: (1) uploading video contents, also auto data transferring service minimize process of data transfer (2) control sharing by selecting audience (3) setup streaming by video sharing session invitation (4) organize and retrieve content

Figure 6**:** BaVio web interface, design focused on watching videos, audio and text comments, Indication for number of comments for each video clip and creating Audio, Video and Text comments. Most recent video shows at left top and other videos are arranged by date. Videos also can be sorted by type and name. The comments list in created time order.

Mobile Interface

Live mobile video streaming enable to share spontaneous moments. Mobile phone enabled to have video sharing session while user is capturing videos. BaVio streaming button will appear on screen while capturing video. User can invite multiple people to join video sharing session. After finishing capture, a video automatically saves to BaVio system.

Figure 7: BaVio mobile interface: BaVio streaming button (Above), invitation (Below right), Waiting for response (Below left)



TV Interface

When new parents subscribed for BaVio TV channel, they will receive BaVio device that supports live videoconference and video message. TV interface is simple enough for everyone use. It is mainly focused on watching and commenting videos. To create comments on video you need to press comments button that enable to record, forward, backward, stop and play. Recent videos are arranged by posted date and shows number of comments. TV interface navigation works by left and right horizontal direction and vertical direction for viewing comments..

Figure 8: BaVio Device for creating video, Audio comments,

Figure 9: BaVio TV interface for watching video and comments.

When a new video is posted a device gives sound and text notice on LCD. It enables to capture video comments as well as live audio comments. It can be placed on the top of HDTV.

Conclusion

This project provides an example of “enhancing emotional connection among family members”, a user centered design approach that focuses on increasing feelings and involvement towards a new family member through service and product interaction. Through the ethnographic research we evaluated key needs for new parents who have desire to share their newborn baby’s life with other family members. Also other family members need to embrace their new family member’s life. We presented main roles of BavVio system that support spontaneous mobile video sharing, TV interface enable watching videos and creating comment especially for grandparents. Moreover, captured moments and comments of baby video will support personal or family archive to revisit later for future use. We believe BaVio system can help families’ communication avoiding technology difficulties among different generation and providing opportunities to participate new family member’s life, connecting emotional experience.

References

Gregory D,Abowed, Matth Gauger,Andreas lachenman. (2003). "The family Video Archive; An annotation and browsing environment for home movies".MIR'03,ACM press.

Maryam Kamvar,Patrick Chiu,Lynn Wilcox,Sandeep Casi,Surapong L,MiniMedia "Surf: Browsing Video Segment on Small Displays",CHI2004,ACM Press.

Kihwan Kim,Irfan Essa,Gregory D.A. (2006) . "Interactive mosaic Generatin for Video Navigation",MM'06,ACM press.

Girgensohn, A., Borezky, J., Chiu, P., Doherty, J., Foote, J., Golovchinsky, G., Uchihashi, S. and Wilcox, L. (2000)" A Semi-automation Approach to Home Video Editing", UIST'00, ACM press.

Hua, X., Lu, L. and Zhang, H. (2003) "AVE- Automated Home Video Editing", MM'03, ACM press.

David, K., Abigail, S., Richard, H. and Ken, W. (2007) "Understanding Video work.", CHI2007, ACM press.

Kenton, O., April, S., Mitchell, Alex, V.(2007) "Consuming Video on Mobile Devices", Hewlett-Packard Labs, In proc, CHI2007, ACM press .

MJ Halvey, MT Keane. (2007) "Exploring Social dynamics in online media sharing",ACM press.

MMG Shannon. (2007) "Shaking hands,kissing babies, and blogging?",ACM press.

S Counts, E Fellheimer.(2007) "Supporting Social Presence through lightweight photo sharing On and Off the desktop", In Conference in Human Factors 2007 , ACM press.

Julie A. Kientz, Rosa I. Arriaga, Marshini Chetty, Gillian R. Hayes, Jahmeilah Richardson, Shwetak N. Patel, Gregory D. Abowd. (2007) "Grow and know: understanding record-keeping needs for tracking the development of young children", Georgia Institute of Technology, Atlanta, GA CHI2007, ACM press.

Wendy Moncur. (2007) "Providing affective information to family and friends based on social networks", University of Aberdeen, Aberdeen, Scotland UK, , CHI2007, ACM press.